NARUC
National Association of Regulatory Utility Commissioners

NASEO
National Association of State Energy Officials

NARUC-NASEO Initiative: Comprehensive Planning in an Era of Load Growth

Virtual Learning Session: Effectively Considering the Distribution System in Integrated Resource Planning

February 25, 2026, 3:00 - 4:30 pm ET

Hosts: Danielle Sass Byrnett (NARUC), Kirsten Verclas (NASEO)
Zoom support: Jessica Diaz (NARUC)

Agenda

- 3:00-3:05 p.m.: Welcome, announcements, introductions
- 3:05-4:05 p.m.: Expert presentation and Q&A
  - Grace Relf, Lawrence Berkeley National Laboratory
- 4:05-4:30 p.m.: Small group discussions

NOTE: Registration open for next in-person workshop on May 6-7, 2026 in Historic Charleston, SC

Travel funding available

Distribution System Planning Peer-Sharing

New webinar series for public utility commissions and State Energy Offices to share insights on electric distribution system planning and engage with subject matter experts.

March 16–*Balancing Information Needs and Volume in Filings*
May 14–*Integrating Resilience Planning*
June 22–*Advanced Building Technologies*
August 13–*Stakeholder Engagement*

3:00 to 4:30 p.m. ET
Hosted by NARUC, NASEO and Berkeley Lab

Learn more and register for each webinar here

Effectively Considering the Distribution System in Integrated Resource Planning

NARUC-NASEO Comprehensive Electricity Planning Initiative

Grace Relf, Lawrence Berkeley National Laboratory

February 25, 2025

Energy Technologies Area
BERKELEY LAB

This work was funded by the U.S. Department of Energy, under Contract No. DE-AC02-05CH11231.

Agenda

- Objectives
  - Equip participants with information on leading distribution planning practices that can be integrated within integrated resource planning (IRP) to enhance planning outcomes towards state objectives
  - Provide concrete examples of planning practices to enable participants to ask meaningful questions of utilities and effectively guide utility planning
- Agenda
  - Section 1 – Planning Assessment
    - Background and Context
    - Comparing IRP and Distribution System Planning (DSP)
    - The Value Proposition for Coordination and Integration
  - Section 2 – Emerging Practices
    - Analytical Linkages and Methods
    - Conclusions

Section 1 – Planning Assessment

Background and Context

Scope

- This presentation focuses on **how to better consider elements of DSP as part of IRP** or other long-term planning processes for bulk power systems in order to improve their quality and effectiveness as a tool to identify an optimal set of resources to meet future needs at least cost.
    - Identify key **touchpoints** between these two processes and identify a range of **coordination and integration tactics** for considering distribution system needs in IRP to improve planning outcomes.

Coordinated

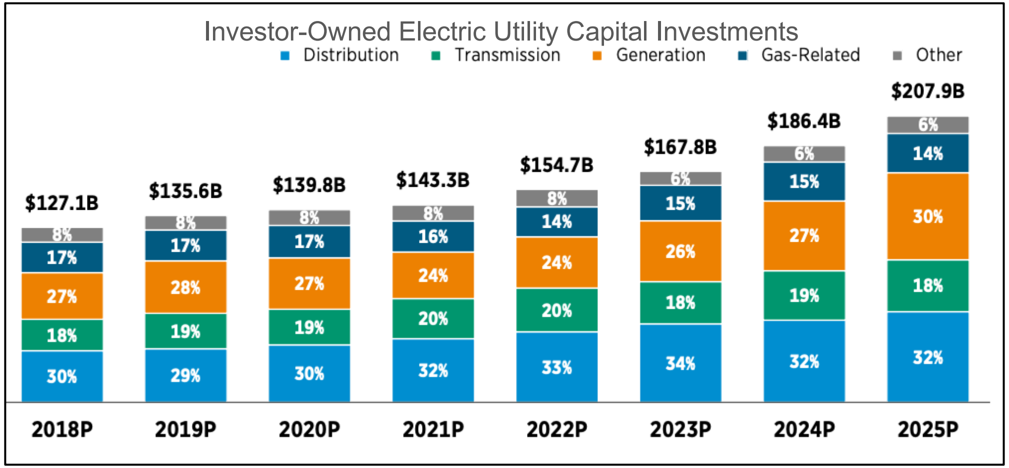
IRP and DSP are conducted separately, with key bridges between each process

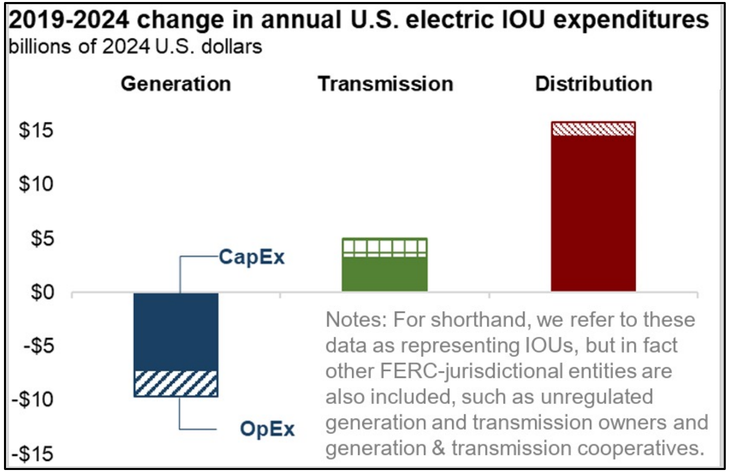
Integrated

IRP and DSP are conducted as part of the same planning process, or DSP is substantively embedded within IRP processes

Distribution System Planning Is Increasingly Important

- Distribution system investments account for the largest portion of capex for U.S. investor-owned utilities — 32% in 2025 (estimated $66.5B)
    - Distribution CapEx rose in all U.S. regions over the last 5 years
- **Distribution resources affect the type, timing, and amount of bulk system needs.**



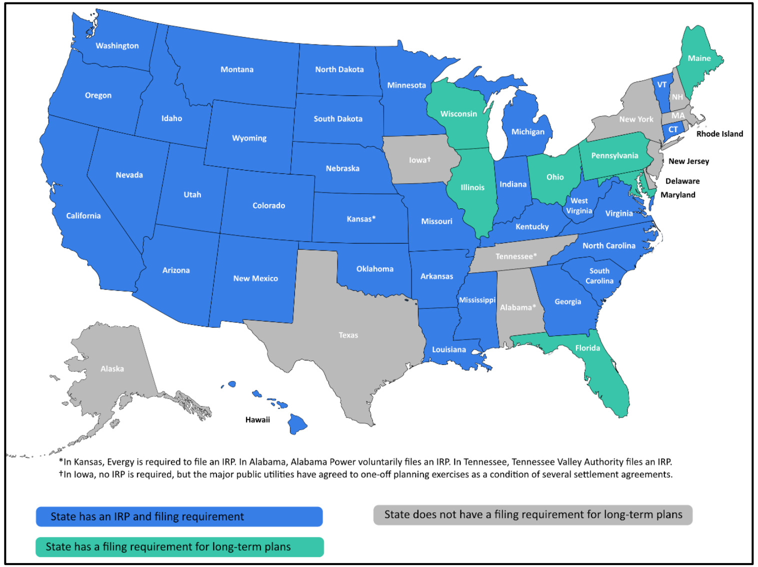


Sources: EEI 2025, Wiser et. al, 2025

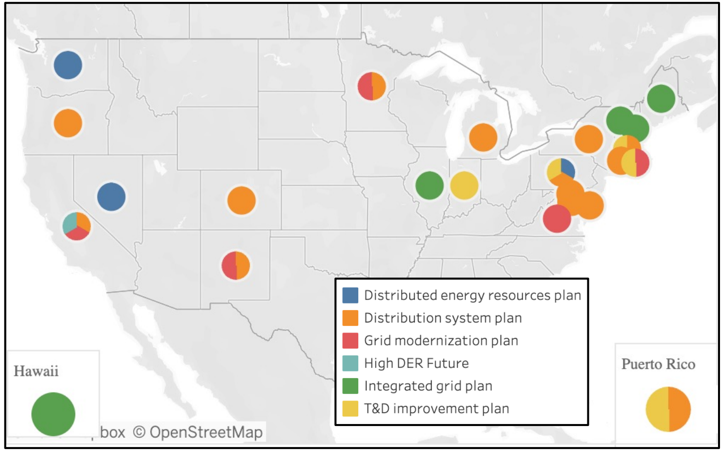
Comparing IRP and DSP

IRP and DSP Filing Requirements

- Most states require IRP or other long-term bulk system plan



- All utilities conduct DSP to maintain a reliable and safe local grid
- 22 states, DC and PR require regulated electric utilities to file some type of distribution plan



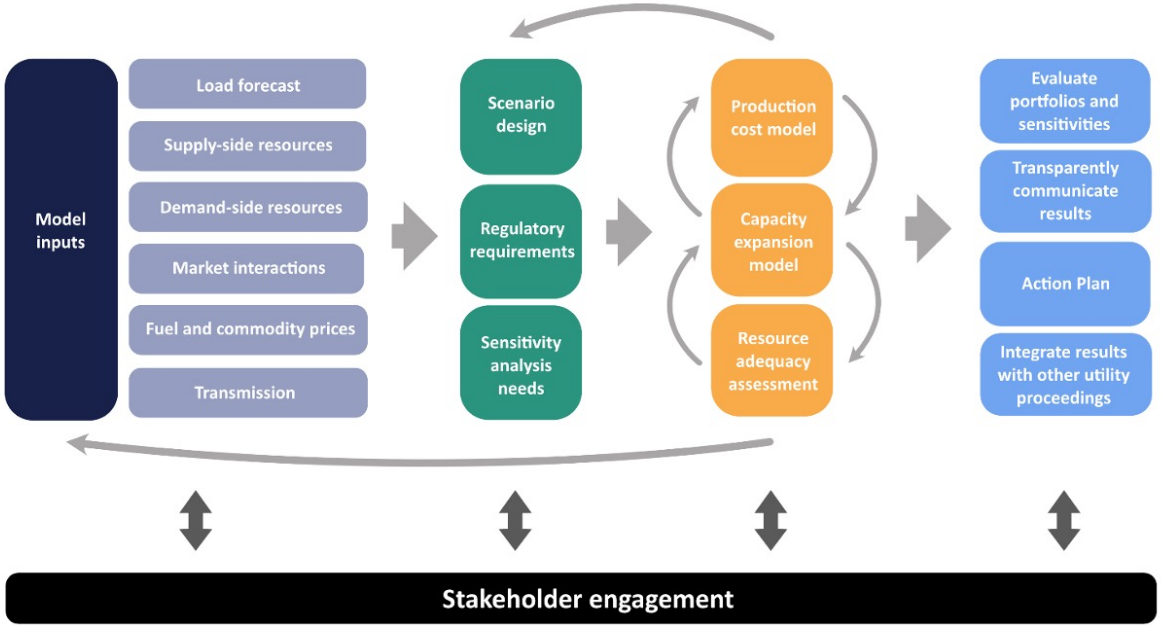
Sources: LBNL 2024(a), LBNL 2024(b)

IRP: Overview

IRP identifies a "least-cost, long-term portfolio of generation resources (generation and storage investments, retrofits, and retirements) and demand-side resources (demand response and energy efficiency)" to meet forecasted electricity demand (ESIG, 2025).

- IRP optimizes resources under plausible futures to meet demand over a specified time period considering constraints
  - Reliability requirements
  - Regulatory and legislative requirements
  - Operational constraints
  - Market factors
- An IRP filed every 1 to 5 years covers a planning horizon between 10 and 20 years (or more)
  - IRP include a near-term (2–5 year) action plan that identifies planned asset procurements, additional studies to complete, and strategies for regulatory compliance
  - IRP informs procurement needs and cost recovery proceedings
- IRP provides transparency into utility planning and decision-making and engages stakeholders

IRP: Overview

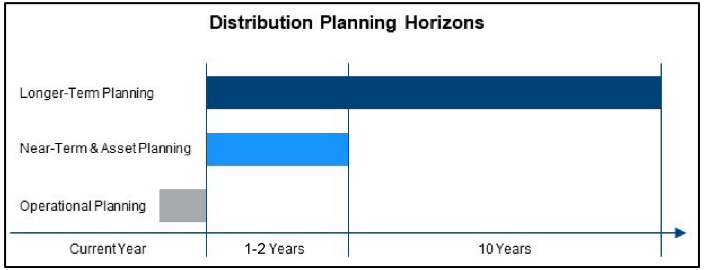


Source: LBNL 2024

DSP: Overview

DSP "focuses on designing, managing, and maintaining lower-voltage networks that connect end users to the larger power system" (ESIG, 2025).

- DSP assesses any physical and operational changes needed to maintain safe and reliable service on the local grid
- Annual DSP covers a 1- or 2-year planning horizon
  - Identifies and defines distribution system needs
  - Identifies and assesses possible solutions
  - Selects projects to meet system needs
- DSP includes a long-term utility capital plan
  - Includes solutions and cost estimates, typically over a 5- to 10-year horizon
  - Updated every 1 to 3 years
- *Integrated* DSP is a decision framework to identify long-term investment strategies for local grids, addressing state and local goals, objectives, and priorities, consumers' needs, and evolution at the grid edge.



Sources: DOE 2020, LBNL 2025

DSP Plan Components

- Planning goals and objectives
- Stakeholder engagement
- Baseline distribution system information
- Load and GER forecasts
- Scenario development and analysis
- Hosting capacity analysis
- Grid needs assessment
- Non-wires alternatives analysis
- Reliability and resilience analysis
- Coordination with other planning processes

Additional or sub-components

- Resilience threat-based risk assessment
- Worst-performing circuits analysis
- Asset management strategy
- Cost-effectiveness framework for investments
- Value of grid-edge resources (GERs)
- Grid modernization plan
- Multi-objective decision-making
- Interconnection
- Distribution investment strategy
- Functional requirements analysis
- Geotargeting programs
- Procurements

Comparing DSP and IRP Processes

Element	DSP	IRP
Question answered	How do we design, maintain, and manage the low-voltage network to maintain deliverability and reliability?	What is the least-cost, least-risk mix of supply- and demand-side resources needed to meet long-term electricity demand?
Planning horizon	5–10 years	15–30 years
Load forecast granularity	Localized, disaggregated loads; up to 8,760 hour forecast	System-level peak demand by customer segment
Common modeling tools	• Power flow simulations • Short-circuit / fault modeling	• Capacity expansion models • Resource adequacy models • Production cost models
Other key differences	• Scenario analysis is an emerging practice • Increasingly more dynamic analyses • Locational analysis is important for determining system needs • Utility requirements are less common	• More commonly use scenario analysis • Traditionally assess static snapshot of needs • More options for resource siting/locations • Utility requirements are more common

Sources: ESIG 2025, LBNL 2024

The Value Proposition for Coordination and Integration

Why Coordinate? Overall Benefits of Coordination

Coordinating various plans improves electricity system planning outcomes by:

- Aligning inputs, methods, and information flows across plans for improved consistency
- Ensuring that all factors that influence system needs are captured
- Creating a holistic picture of investment alternatives that can result in cost savings
- Increasing understanding, transparency, and credibility of plan results
- Improving stakeholder ability to participate, resulting in higher quality information available to planners and decision-makers
- Applying knowledge from multiple planning processes to realize efficiencies

Value of Incorporating DSP Elements in IRP

Optimize electricity system infrastructure

- Avoid need to touch infrastructure more than once
- Avoid line losses by building resources closer to load
- Site distribution assets to reduce needs and constraints
- Build and operate system to optimize across all levels
- Enhance procurement with better information about optimal resource timing and siting
- Avoid some infrastructure investments by optimizing use of existing distribution assets

Reduce costs

- Reduce overly conservative assumptions
- Assess all possible solutions

Improve stakeholder credibility, transparency, and communication

- Provide greater insight into distribution expenditures that may drive rate increases
- Better justify distribution-level projects that tie back to filed plan
- Reduce internal utility functional silos

Expert Perspectives: Value of Incorporating DSP Elements in IRP

A commitment to least-cost planning requires integration across planning processes.

There is significant value in getting DSP and IRP teams to talk to one another.

Integrated planning creates a paradigm shift in how utilities treat distribution-level assets and operations.

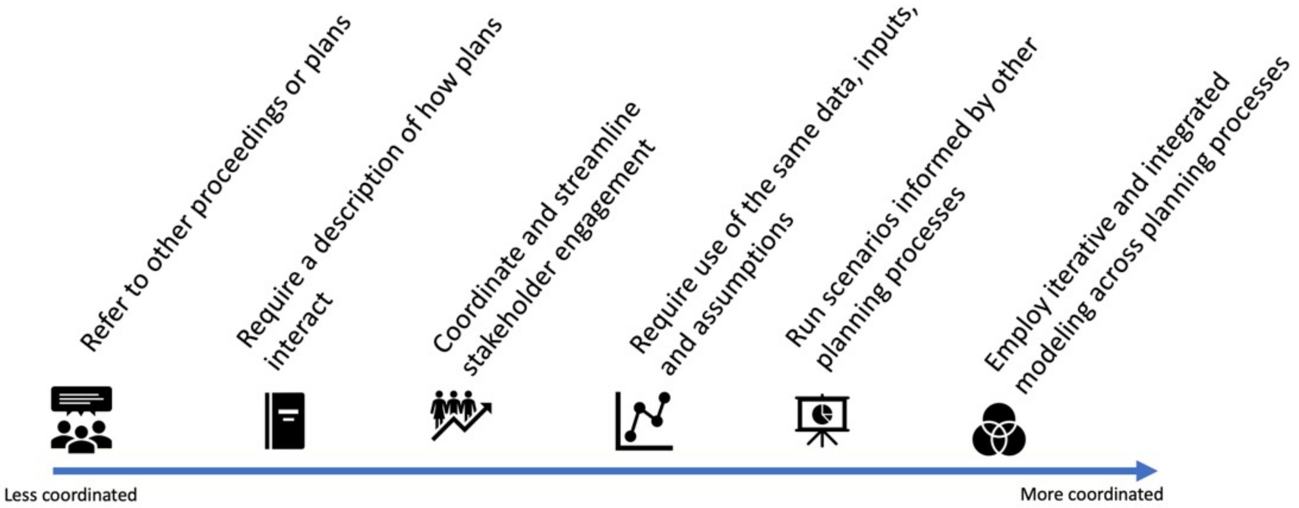
A holistic, long-term view helps to avoid “fire fighting” in addressing system needs.

Integrating DSP elements in IRP can add complexity and time to the process without commensurate value.

Example responses in Berkeley Lab interviews with utilities, PUCs, and other experts

Coordination Actions

- Actions to coordinate plans range in complexity and impact, depending on resource availability (e.g., staff time and modeling tool capabilities), plan maturity, and planning objectives.



Source: Berkeley Lab

Processes for Coordination

Establish robust data management systems to support advanced analyses and information- sharing.

- Currently, no single model optimizes all levels of s system.
- Data marshalling is hard, but good planners fix bad data.

Establish consistent, meaningful, and streamlined opportunities for stakeholders.

- Communicate clearly, using naming conventions, updated calendars, and webpages.
- Solicit candid feedback regularly throughout the process.

Reduce internal utility silos.

- Change management is important when undertaking novel planning practices.

Consider timing requirements across planning processes and sequence appropriately.

- Keep processes separate where appropriate to ensure sufficient depth of analysis and expertise and avoid using resources where not needed.
- Conduct planning in bite-sized pieces to support forward progress.

Section 2 – Emerging Practices

Methods for Coordination and Integration

Key Analytical Linkages Between IRP and DSP

- IRP can inform DSP by identifying the future quantity and role of GERs to help meet bulk power needs.
- DSP can inform IRP through granular forecasting and assessing distribution system capabilities to accommodate GERs to meet resource needs.

Load and GER forecasting	Scenario and sensitivity analysis	Distribution system capacity planning, optimization, and integration of GERs	Co-optimizing bulk power and distribution resources

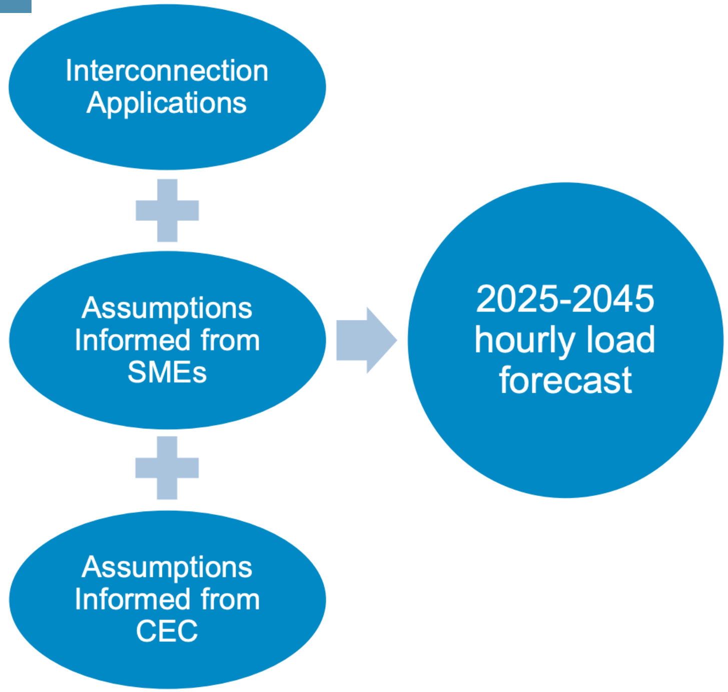
	Distribution-Level Forecast	System-Level (IRP) Forecast
Geographic Scope	Substations and feeders	Whole utility system, state, or region
Forecast Horizon	Near-to-medium term (5–10 years)	Medium-to-long term (10–20+ years)
Granularity	**Highly** granular: Circuit-level peak loads, hourly profiles, locations of GERs	**Aggregate**: System peak and energy; zonal if broken down by region; hourly simulations for entire system
Forecast Method	**Bottom-up**: Uses customer data, technology adoption models, weather factors and tech-specific load shapes	**Top-down**: Uses econometric and end-use models for total load with sensitivities to reflect GER adoption
GERs	Explicitly models local GER adoption	May net GERs out of the load forecast or include them as selectable resources with less locational granularity
Uncertainty	Focuses on **local uncertainty** — exactly where and when new loads will connect	Focuses on **macro uncertainty** — economic growth, fuel prices, state requirements

Source: LBNL and DeMartini, Forthcoming

IRP/DSP Forecast Reconciliation

- Build forecasts from the same data
  - Use consistent assumptions for inputs
  - Disaggregate systemwide forecasts to feeder level; compare and adjust based on granular, locational distribution forecasts
  - Aggregate distribution forecasts to system level
- Consistently consider “known” or “spot” loads such as new developments, data centers, and charging depots
- Discuss discrepancies — forecasting teams, stakeholders
- Sequence DSP and IRP processes to better enable iterative use of data sets and planning results

Pacific Gas & Electric Data Center Forecasting Methodology

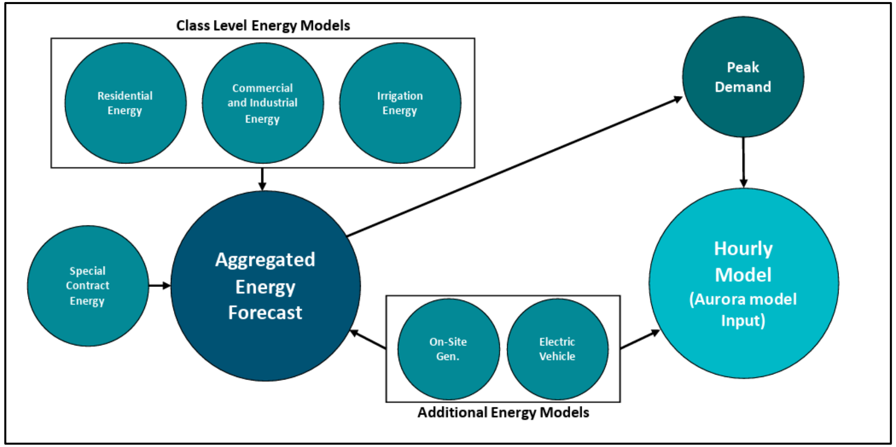


Sources: LBNL and DeMartini, Forthcoming, PG&E, 2025

Forecasting Alignment: Idaho Power

- In Oregon, Idaho Power files an IRP and DSP, connecting its load and GER forecasts.
  - The IRP forecast for GERs uses historical adoption trends and customer billing data. The DSP then geolocates GER installations and uses IRP and growth rate assumptions to develop feeder-level forecasts.
    - The IRP electric vehicle (EV) forecast uses historical adoption trends and county EV registration data. The DSP then proportionally disaggregates the data to feeders in conjunction with additional locational forecasts for charging loads.
  - GERs identified in the IRP action plan feed back into local load forecasts for the DSP.

Idaho Power IRP Load Forecasting Process

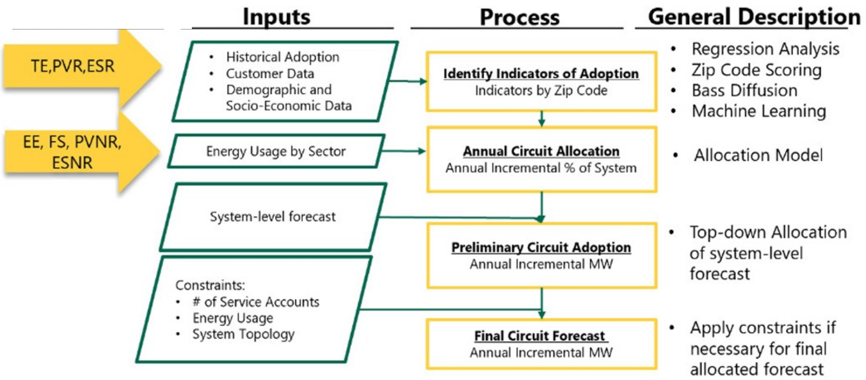


Sources: Idaho Power 2025, Idaho Power 2022

Forecasting Alignment: SCE (1)

- California Energy Commission's Integrated Energy report (IEPR) is a common foundation for energy planning across the state.
- Utilities disaggregate system-level IEPR forecast for distribution planning.
  - For example, Southern California Edison allocates annual load growth to circuits on an hourly basis using econometric models, community and SME input, and known loads.
  - SCE disaggregates GERs using external data sets, allocators, expert review, and stakeholder input.

SCE Forecast Disaggregation Process



residential (PVR/PVNR), energy storage – residential/non-residential (ESR/ESNR), energy efficiency (EE), and fuel substitution (FS)

Source: SCE, 2025

Forecasting Alignment: SCE (2)

SCE - Energy Storage (Non-Residential)

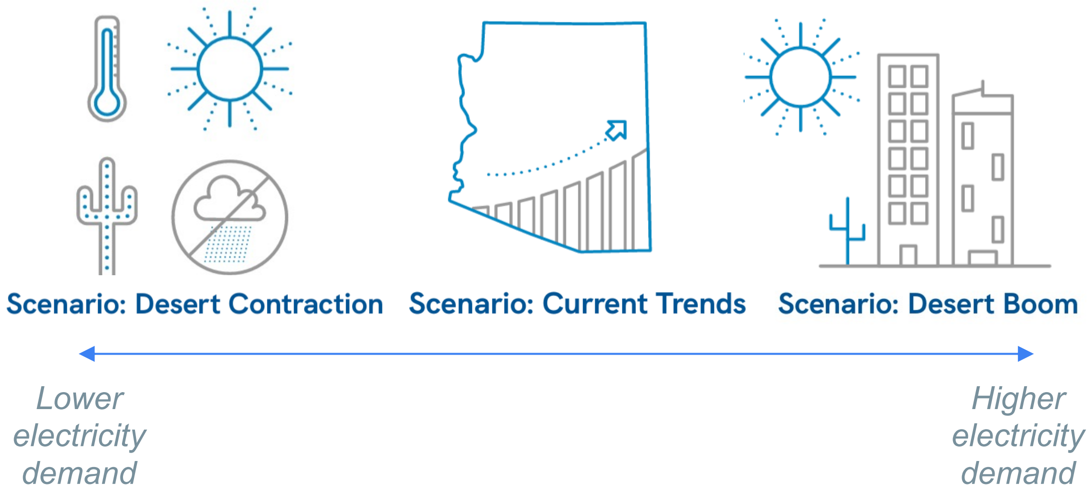
Suppliers	Inputs	Process	Outputs	Customer
SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL® Company	Peak Demand and average energy usage Customer location and circuit	1. Calculate ratios of peak demand/energy usage for each non-residential customer; 2. Assign top 25 percentile customers to be the potential adopters; 3. Calculate # of candidate adopters for each circuit and assign the share ratio to each circuit; 4. Apply IEPR non-residential existing storage forecast to each circuit.	10+ Year Forecast at each of SCE's Circuits	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL® Company Distribution Planning

Source: SCE, 2025

Scenarios and Sensitivities

- Planners use *scenarios* to test various plausible futures to account for uncertainty.
- *Sensitivities* change one factor at a time to understand the impacts of particular inputs and assumptions.
- Scenarios are particularly useful when there is a wide range of possible outcomes, such as for load growth or GER adoption.
- Alignment of scenarios across IRP and DSP support comparable plan outputs.

Salt River Project Integrated System Plan Scenarios



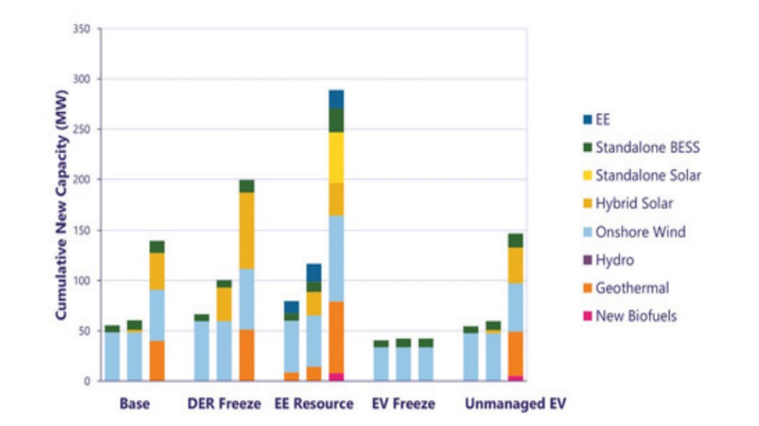
Source: SRP, 2023

Scenarios and Sensitivities: Hawaiian Electric

- Hawaiian Electric evaluated various adoption scenarios for distributed solar and storage, EVs, and energy efficiency (EE).
  - Each scenario changed the overall resource need, mix, and net present value
  - Comparing avoided costs to base case informs programs

2050 Base Case Net Present Value (NPV) and Relative Avoided Costs for Other Scenarios

NPV (2018$, $MM)	Base	DER Freeze: Base	EV Freeze: Base	Unmanaged EV: Base	EE as a Resource: Base
O'ahu	10,798	775	-1,075	93	1,517
Hawai'i Island	1,316	150	-221	13	293
Maui	2,288	178	-282	37	72
Moloka'i	66	3.7	-1.9	0.2	-1.5
Lāna'i	70	1.3	-0.9	-0.1	0.5



Source: HECO, 2023

Scenarios and Sensitivities: State Requirements

Washington

- "The IRP must include a range of possible future scenarios and input sensitivities for the purpose of testing the robustness of the utility's resource portfolio under various parameters."

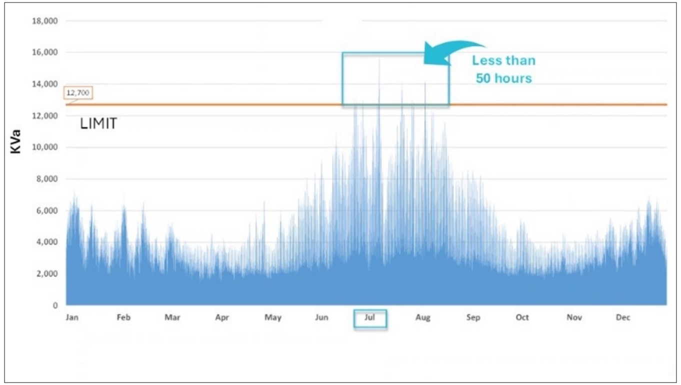
Nevada

- IRP must include, "A comparison of a diverse set of scenarios of the best combination of sources of supply to meet the demands or the best methods to reduce the demands, which must include at least one scenario … that includes the deployment of distributed generation."

Distribution Capacity Planning and Optimization

- Distribution capacity planning is an engineering exercise to ensure substations and circuits and deliver power within thermal, voltage, and protection limits.
  - Understanding factors that affect distribution system utilization is important to effectively considering GER integration and utilization in IRP.
- The distribution system operates well below total carrying capacity most of the time.
  - Planners build the system to meet peak demands and maintain an operational reserve.
  - Optimizing distribution system utilization can reduce the cost of infrastructure buildout.
  - Optimization can include improving customer load factors (ratio of average to peak load) and using flexible resources for contingencies.

Typical Duke Energy Distribution Feeder Loading



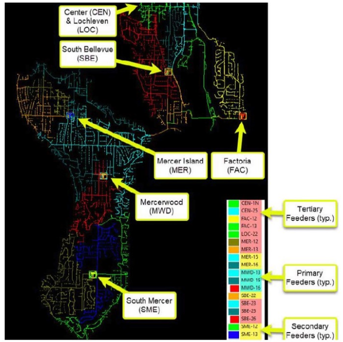
Sources: LBNL and DeMartini, Forthcoming, Duke Energy, 2024

Distribution Capacity Planning: Puget Sound Energy

- PSE is developing an Integrated System Plan (ISP) and forecasting significant load growth.
  - PSE adds system level forecasts, including predicted customer and EV loads, with known large load requests for distribution power flow modeling.
  - PSE estimates that 37% of substations will be overloaded within 10 years.
  - PSE evaluates multiple solutions, prioritizes substation investments, looks at performance ratings, historical loading, and forecasts to inform investments and timing.

As we move to ISP, scenarios will evaluate impacts of assumptions to delivery system capacity needs and the timing of those investments.

System Modeling & Analysis (example: distribution system powerflow in Synergi)



Capacity needs are evaluated for individual equipment, as well as at the substation group level to optimize sharing of load and considers both N-0 and N-1 operating conditions

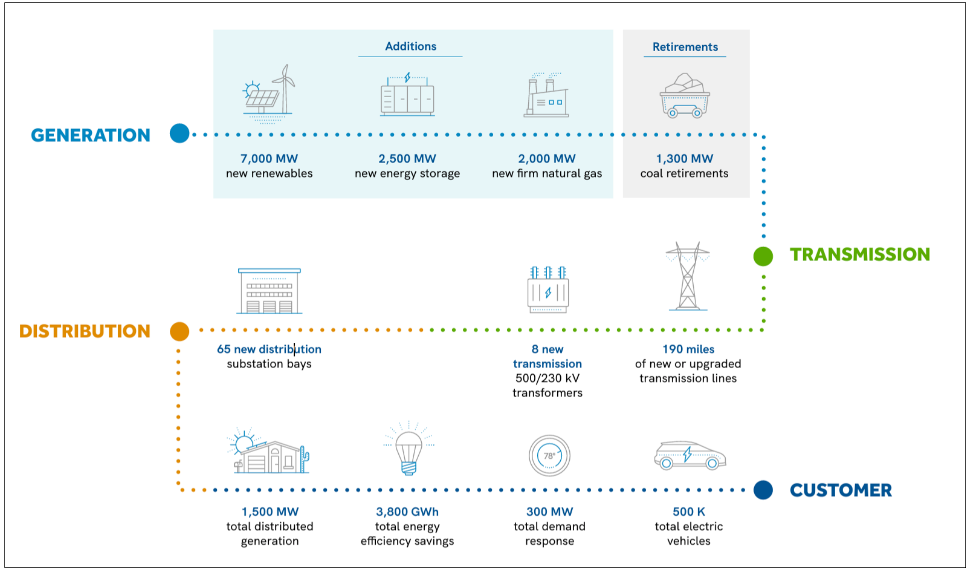
Solution	Description
Expedited substation program	Provide a second transformer bank in an existing substation with immediate needs (3-5 years)
New substation	Construct a new substation in an area with needs in mid-term (5-10 years)
Non-wire alternatives	Solicit DERs and partner with customers through Demand Response or Energy Efficiency to defer investment needs (5-10 years)

Source: PSE, 2025

Distribution Capacity Planning: Salt River Project

- SRP allocates the system-level load forecast to substations using geographic, economic, and historical usage data.
  - SRP identifies overloaded substations using reliability criteria.
  - SRP looks to shift loads to neighboring equipment before identifying new investment needs.
- SRP's "Distribution Enablement Roadmap" includes advanced locational planning, improved interconnection processes, and research and development.

SRP Balanced Integrated System Plan



Source: SRP, 2023

Distribution Optimization: Idaho Power

- Idaho Power is modeling distribution-connected battery storage for its IRP to enable cost savings through the deferral of T&D system upgrades.
- These projects are located at different substations, under 5 MW each, totaling 11 MW, and expected to defer investment needs for 4–10 years.

Idaho Power Distribution-Connected Storage Systems

Location	Year	Capacity (MW)	Energy (MWh)	Estimated Deferral Years
Filer	2024	2	8	5
Weiser	2024	3	12	10
Melba	2024	2	8	4
Elmore	2024	4	16	9

Integrating GERs

Hosting capacity analysis

Quantify grid upgrade requirements to balance near-term GER adoption with long-term system investment needs

Improved interconnection procedures and flexible interconnections

Support cost-effective and faster deployment of GERs identified in IRP

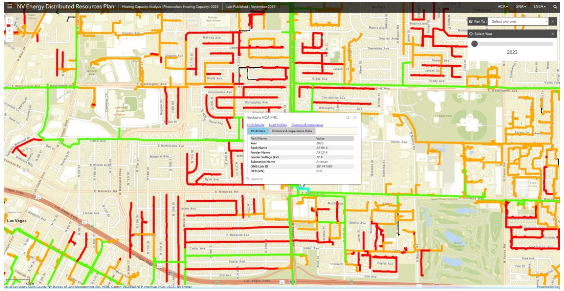
GER deliverability reviews

Build confidence in the ability of GERs to provide services identified in IRP

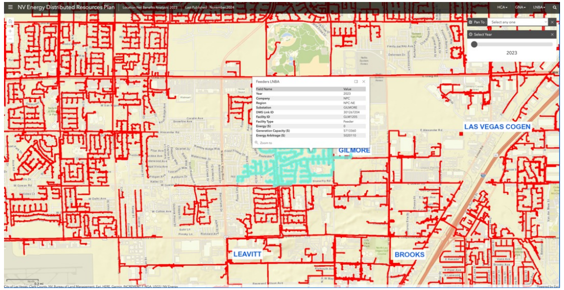
Integrating GERs: NV Energy

- Nevada requires utilities to include GER plans in IRPs.
- NV Energy's 2024 IRP includes:
  - Discussion of how the GER plan is coordinated with other components of IRP
  - Transportation Electrification Plan
  - Discussion of continued refinement of local resource analysis going forward
  - Publicly available portal
    - Locational net benefits analysis
    - Hosting capacity analysis for three scenarios
    - Load profile and data downloads
    - Grid needs assessment data

Hosting Capacity Analysis



Locational Net Benefits Analysis



Sources: NV Energy 2024, NV Energy

Integrating GERs: Georgia Power

- Following its 2022 IRP, Georgia Power solicited almost 300 MW of distributed generation.
- The utility provided bidders with locational guidance, including a hosting capacity map, resulting in a higher percentage of feasible bids than prior efforts.
- Georgia Power proposes additional procurement improvements in its 2025 IRP.
  - Option for bidders to receive system value credit for co-locating utility-controlled storage
  - More locational granularity in assigning avoided transmission credits to projects

Georgia Power's Cost Benefit Framework for Distributed Generation Procurements

Component	Utility Scale	Distributed Generation	Owned or Contracted	Energy Only
Avoided Energy Costs	Benefit	Benefit	Include	Include
Deferred Generation Capacity Costs	Benefit	Benefit	Include	Exclude
Avoided Transmission Losses	N/A	Benefit	Include *	Include *
Locational Transmission Value	N/A	Benefit or Cost	Include *	Exclude
Avoided Distribution Losses	N/A	Benefit **	Include *	Include *
Integration Costs	Cost	Cost	Include	Include
Renewable Energy Certificates	Benefit	Benefit	Include	Exclude

* Inclusion is determined by interconnection location on the distribution system.
** The avoided distribution loss benefit is determined by the interconnection location on the distribution system

Source: Georgia Power, 2025

Integrating GERs: Massachusetts

- Massachusetts identified a significant need for new resources to meet state objectives.
  - Interconnection costs are a barrier to resource deployment.
- A provisional Capital Investment Project (CIP) program addresses near-term distribution grid needs for group study projects facing high interconnection costs.
  - The CIP allocates costs to interconnection customers and distribution customers based on accrued benefits.
- A Long-term System Planning Proposal builds on the CIP to proactively identify distribution needs.
  - Utilities would assess flexible interconnection options for additional system benefits.

Proposed Long-Term System Planning Cost Allocation Principles

Beneficiary Pays	• Covers both GER and end-use load customers • Covers customers interconnecting at different points in time
Sound Development Signals	• Encourages development where there is hosting capacity available • Reduces costs for certain flexible interconnections and co-optimization of resources to meet other system needs
Cost Efficiency	• Encourages efficient use of hosting capacity by deploying techniques like co-location with storage, technical de-rating, and dispatch-limiting schedules

Source: MA Joint Utilities, 2025

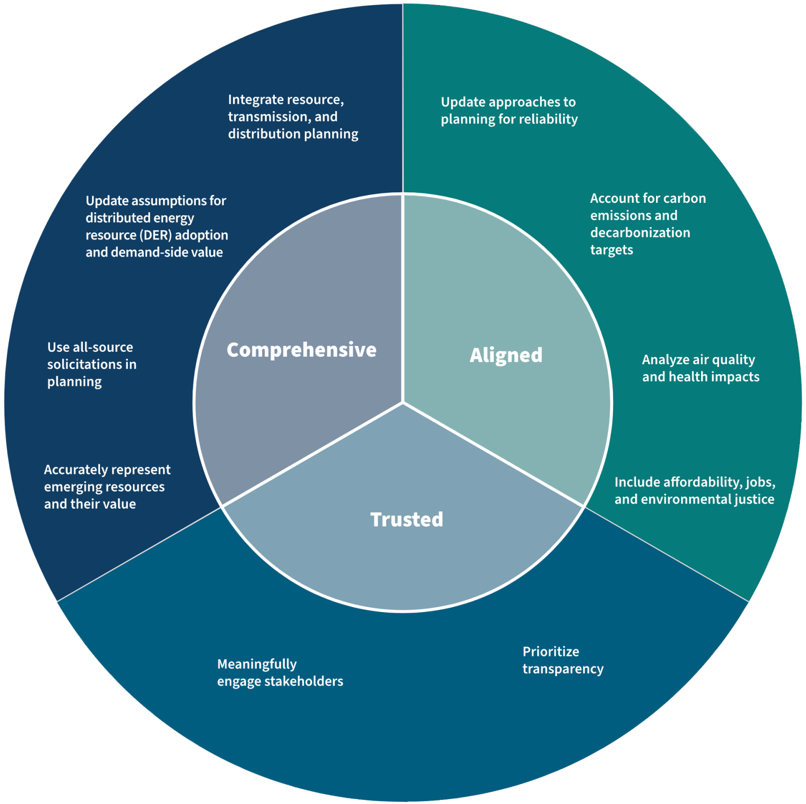
Integrating GERs: Resource Deliverability

- Federal Energy Regulatory Commission (FERC) Order 2222 removes barriers to GER aggregations in wholesale markets.
- Affected utilities have 60 days to review proposed aggregations in their service territory.
  - Capability review – Confirmation of executed interconnection agreements and review for conflicts with retail tariffs or compensation schemes
  - Safety and reliability review – Evaluation of dispatch profiles, hourly storage schedules, and interconnection agreement limits such as export caps
- Ensure GERs are deliverable for bulk services and unconstrained by hosting capacity limits

Source: ISO-NE

Co-Optimizing Resources

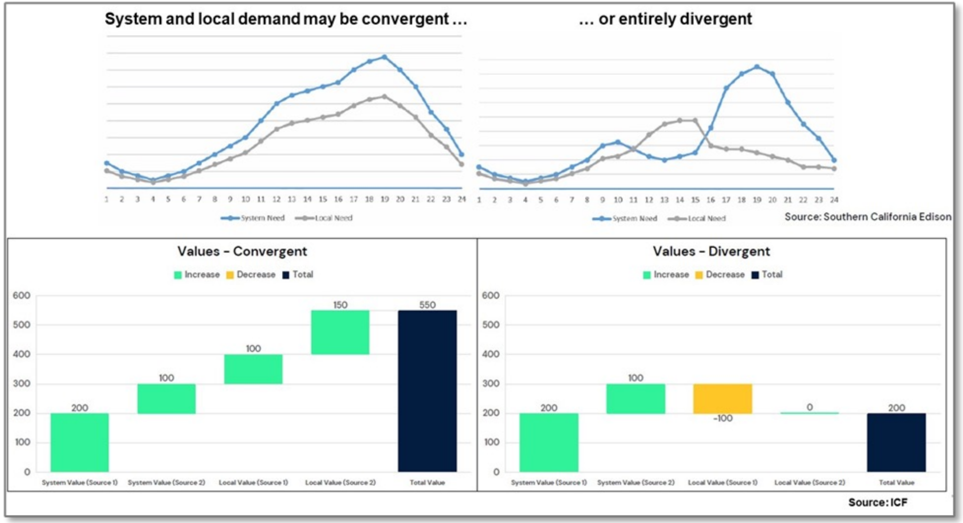
- Some states and utilities are moving toward planning processes that consider all levels of the grid in conjunction with one another.
- Fully Integrated System Planning considers generation, transmission, distribution, and customer resources together.
    - Truly integrated system planning is still nascent, and the depth of integration varies.
    - Best practice is to develop iterative feedback loops between process steps.
- Integrated System Planning may look at gas and electric systems together.



Source: RMI

Co-Optimizing Resources: Convergent & Divergent Analysis

- Distribution feeder peaks may occur at a different time or magnitude compared to bulk system demand due to:
  - Type of loads on the feeder
  - Weather variations across a service territory
  - Penetration of GERs
  - Diversity of individual feeder demands
- Convergence or divergence affects the value of distribution resources for bulk power system needs.



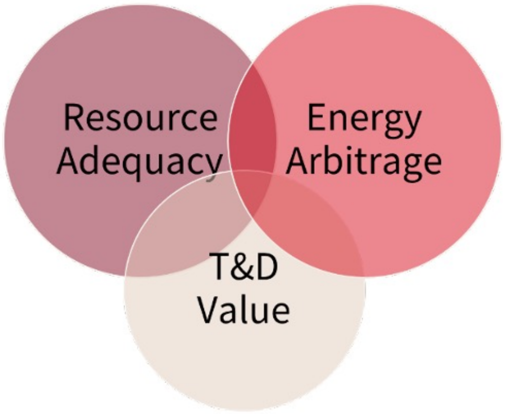
Sources: LBNL and DeMartini, Forthcoming

Energy Technologies Area
BERKELEY LAB

Co-Optimizing Resources: Xcel Energy

- Following initial development in its 2024 IRP, Xcel Energy is proposing a Capacity*Connect program.
  - Deployment of 50–200 MW of utility-owned and operated distribution-sited batteries through 2028 — $152–$430M
- Program would provide operational experience for optimizing distribution system for bulk system benefits
  - Xcel expects majority of value from battery participation as a capacity resource in ISO’s resource adequacy construct and additional value from participation in an energy market or through avoided energy market purchases
  - Program could provide faster, cheaper interconnection
- **Site batteries where distribution and bulk loads coincide to reduce or defer investments**

Program Value Streams

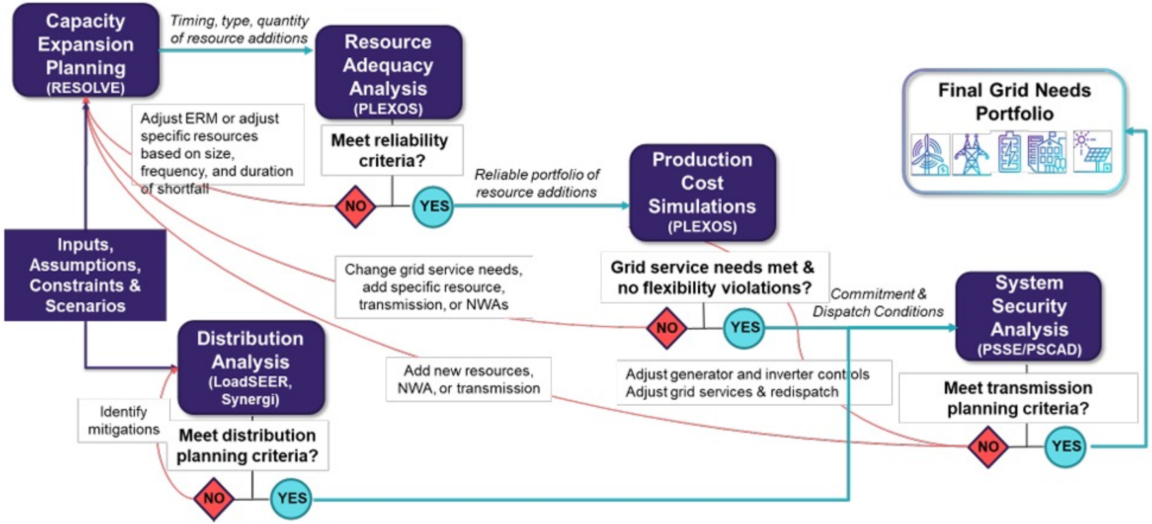


Source: Xcel MN, Docket 25-378

Co-Optimizing Resources: Hawaiian Electric

Hawaiian Electric deploys iterative modeling across generation, transmission, and distribution

- System security analysis accounts for distribution resources
- If violations occur, utility iterates to identify distribution system needs
- Production cost model helps identify cost-effective solutions



Source: Hawaiian Electric

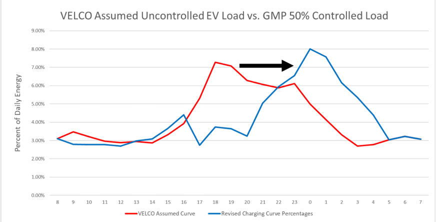
Co-Optimizing Resource: Vermont

- Utilities optimize electric system plans to comply with state statutes for least-cost planning.
- Identify how distribution assets could defer need for T&D upgrades, translating into customer savings.
    - 2024 Long-Range Transmission Plan identified need for new line & transformer upgrades by 2032 at a cost of $200M, driven by load growth
    - Using hourly data, Green Mountain Power identified distribution-level solutions to support deferral of transmission investment need
- The Vermont System Planning Committee is a bridge for communication, including aligning and vetting assumptions and using the same models.

Source: GMP, 2025

Non-Transmission Alternative Analysis

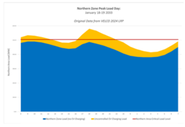
EV Charging Curve Comparison



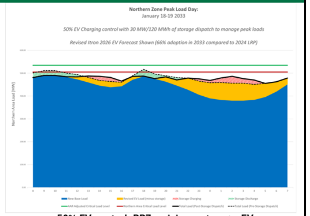
- 2024 Long Range Plan assumed 0% EV charging Control
- A revised charging management program that can control 50% of EVs in study area can shift peak loads to later in the evening and ensure all cars are charged by morning.

GREEN MOUNTAIN POWER

Combining All NTA Solutions



No EV Controls and old rating methodology: 75 MW of load reduction needed and 300+ MWh of load management in 1 day



50% EV control, PP7 revisions, storage, EV sensitivities considered: Load remain below critical load level with proper program design and storage dispatch

GREEN MOUNTAIN POWER

Energy Technologies Area
BERKELEY LAB

Conclusions

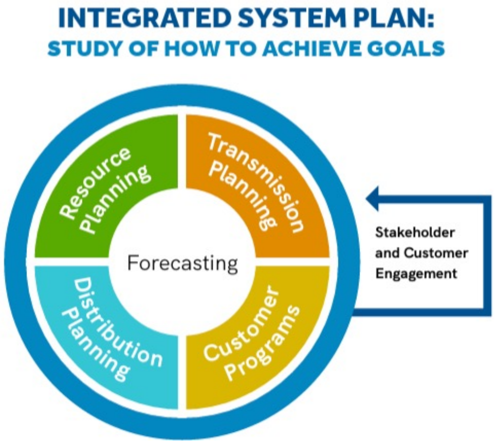
Coordination of DSP With IRP and Other Types of Plans

State	Bulk Power (IRP and Transmission)	DERs (including efficiency)	Electrification	Other Related Plans	Highest Level of Coordination
CA	●	●	●	●	
CO	●	●	●	●	
DC				●	
HI	●	●	●	●	
IL	●	●	●	●	
ME	●	●	●	●	
MA	●	●	●	●	
MI	●	●			
MN	●		●	●	
NV	●	●			
NM	●			●	
NH		●		●	
NY	●	●	●	●	
OR	●	●	●	●	
RI		●		●	
VT	●	●	●	●	
VA	●			●	
WA	●	●	●	●	

Source: Berkeley Lab

Key Takeaways

- States and utilities are taking meaningful steps to coordinate and integrate IRP and DSP.
  - Evaluating the impacts of integration is challenging, but maximizing use of distribution-level assets increases their value.
  - The changing landscape of utility planning – growing distribution system needs and resources and increased focus on affordability – requires increased consideration of the distribution system.
- Identify key bridges between both processes.
  - May require more sophisticated distribution planning practices
- Good planning depends more on the people than the tools.
  - Communication among planners, regulators, and stakeholders in collaborative venues is key.
  - Expertise across stakeholders at the nexus of DSP and IRP is nascent.



Source: SRP, 2023

Thank you!

Resources for More Information

- Berkeley Lab, Effectively Considering the Distribution System in Integrated Resource Planning, Forthcoming
- Berkeley Lab, Integrated Distribution System Planning website, including interactive DSP decision framework
- Schwartz, L., N. Mims Frick, S. Murphy, G. Pereira, G. Relf, J. Shipley, J. Schellenberg, and A. Fernandez. 2024. *State Requirements for Electric Distribution System Planning*. Berkeley Lab. Complementary online catalog
- Murphy, S., L. Schwartz, G. Pereira, and C. Davis. 2025. *Bridging the Gap on Data and Analysis for Distribution System Planning: Information That Utilities Can Provide Regulators, State Energy Offices and Other Stakeholders*. Berkeley Lab
- Energy Systems Integration Group. 2025. Integrated Planning Guidebook: A Practical Coordination Framework for Electricity Planners. A report by the Integrated Planning Task Force. https://www.esig.energy/integrated-planning/
- Collins, Myles T, Matia Whiting, Josh A Schellenberg, and Lisa C Schwartz. 2025. *Bridging the Gap on Data, Metrics, and Analyses for Grid Resilience to Weather Events: Information that utilities can provide regulators, state energy offices, and other stakeholders*. Berkeley Lab
- Schellenberg, J., and L. Schwartz. 2024. *Grid Resilience Plans: State Requirements, Utility Practices, and Utility Plan Template*. Berkeley Lab
- Burdick, A., J. Hooker, L. Alagappan, M. Levine, and A. Olsen. 2024. "Integrated System Planning: Holistic Planning for the Energy Transition," Energy and Environmental Economics, Inc.
- LeBel, M., R. Sandoval, N. Mims Frick, and J. Deason. 2025. *Opportunities for Integrating Electric and Gas Planning*. Regulatory Assistance Project and Berkeley Lab
- Shipley, J., J. Barlow, and G. Relf. 2024. *Review of Literature and Utility Commission Proceedings Relevant to Integrated System Planning: Annotated Bibliography Prepared to Support the Washington Utilities and Transportation Commission*. Pacific Northwest National Lab and Berkeley Lab
- Dyson, M., L. Swishberg, and K. Stephan. 2023. *Reimagining Resource Planning*. Rocky Mountain Institute

Q&A

Please raise your hand or share your question in chat.

Energy Technologies Area
BERKELEY LAB

Breakout Rooms

- **Two breakout room options**
  - within RTO/ISO vs. outside RTO/ISO
- **Once breakout rooms open, please click ‘join’ next to the option you would like, and you will be taken to your breakout room.**